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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/765,308	MOON, SEONG HAK	
	Examiner	Art Unit	
	Pegeman Karimi	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-11,13,14 and 17-36* is/are rejected.

7)☐ Claim(s) *12,15 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *07/05/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claims 11, 12, 15, and 16 are objected to because of the following informalities:

The use of parentheses in claims 11, 12, 15, and 16 are improper since parentheses are used only for the reference characters; see MPEP 608.01 (M).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> **The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.**

Claim 10 recites the limitation "the positive reset pulse with the sawtooth waveform" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "the negative sawtooth waveform reset pulse" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-8, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Moon (U.S. Pub. No. 2002/0196210).

As to claim 1, Moon ('6210) teaches a scan driving method of a field emission display device (FED, fig. 15) in which:

a data pulse (D1, D2, ..., Dm) is applied to a data electrode ([0063], lines 3-5) and

a scan pulse (SP) and a reset pulse (RP) are alternately applied to a scan electrode (S1), (e.g. SP and RP are applied to scan line S1 alternatively), including: a step in which when a reset pulse (e.g. RP) is applied to one of a plurality of scan electrodes (RP is applied to scan electrode S1), the reset pulse is also applied to all the remaining scan electrodes (RP is applied to scan electrodes S1 through Sm).

As to claim 17, Moon ('6210) teaches a scan driving method of a field emission display device (FED, fig. 15) in which:

a data pulse (D1 through Dm) is applied to a data electrode ([0063], lines 3-5) and

a scan pulse (SP) and a reset pulse (RP) are alternately applied to a scan electrode (S1), (e.g. SP and RP are applied to scan line S1 alternatively),

comprising: a step in which a scan pulse (SP) and a reset pulse (RP) are alternately applied to one scan line (e.g. SP and RP are applied to scan line S1 alternatively) constituting a panel of the display device (Data lines and scan lines with reset pulses are applied to the panel of Fig. 14A-D); and

a step in which when a reset pulse (RP) is applied to one scan line (RP is applied to scan electrode S1), the reset pulse is applied also to other remaining scan lines (RP is applied to scan electrodes S1 through Sm) constituting the display panel (Data lines and scan lines with reset pulses are applied to the panel of Fig. 14A-D).

As to claim 18, Moon ('6210) teaches a scan driving method of a field emission display device (FED, Fig. 15) in which a data pulse (D1 through Dm) is applied to a data electrode ([0063], lines 3-5) and a scan pulse (SP) and a reset pulse (RP) are alternately applied to a scan electrode (Sm), (e.g. SP and RP are applied to scan line Sm alternatively) comprising:

applying a scan pulse (SP) in synchronization with the data pulse (D1) to the scan electrode (e.g. Sm), (SP in electrode S1 is synchronized with the first DP pulse, and SP in electrode Sm is applied to last DP pulse) and

applying a reset pulse (RP) having a certain voltage (+5 volts) to the scan electrode at a point when the scan pulse rises (RP is applied to scan pulse SP at a point when the signal SP is rising in electrode Sm, Fig. 5).

As to claim 2, Moon ('6210) teaches the scan pulse (SP) applied to the scan electrode (e.g. S1) is synchronized with a data pulse (D1) applied to the data electrode (D), (SP in electrode S1 is synchronized with D1 and SP in electrode S2 is applied to D2).

As to claim 3, Moon ('6210) teaches the scan pulse (SP) and the reset pulse (RP) are controlled by an external switching control signal and a timing control signal (scan pulse are controlled by timing controller 521 and switch 525), ([0074], lines 1-3; [0080], lines 1-5) and (reset pulse is controlled by timing control and switch), ([0082], lines 4-6; and [0087], lines 2-4), (See Fig. 6).

As to claim 4, Moon ('6210) teaches the reset pulse (RP) is simultaneously applied to every scan electrode (S1, S2, ..., Sm) constituting the panel (Fig. 4), after the scan pulse is applied (reset signal RP is applied to every scan line and after scan pulse signal SP).

As to claim 5, Moon ('6210) teaches the reset pulse (e.g. RP) is applied to a blanking signal interval (interval between the D1 and D2, [0177], lines 2-3), not to an image signal interval (image signal interval = D1, D2, ..., DP), (Fig. 4).

As to claim 6, Moon ('6210) teaches the reset pulse (RP) is applied between scan pulse (SP of S1) and next scan pulse (SP of S2), and the reset pulse is simultaneously applied also to other remaining scan electrodes (RP is applied to all other remaining scan electrodes that are S2, S3, ..., Sm at once, see Fig. 4) to which

the scan pulse has not been applied (RP is applied to scan electrodes S2 through Sm, which scan pulses SP have not been applied yet).

As to claim 7, Moon ('6210) teaches reset pulse (RP) having a positive voltage ([0161], lines 1-3) is applied when the scan pulse is completed (Reset pulses are applied after the scan pulses SP, see Fig. 9), in order to sharply increase a tilt of a rising pulse of the scan pulse ([0150], lines 1-4; [0160], lines 1-4).

As to claim 8, Moon ('6210) teaches the tilt of the rising pulse of the scan pulse (slope of RP) is controlled by a resister provided in a pulse generator (555), ([0149], lines 1-2]).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 9-11, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Kawasumi (U.S. Patent No. 6,087,788).

As to claim 19, Moon ('6210) teaches a scan driving method of a field emission display device in which:

a data pulse (DP) is applied to a data electrode (data electrodes D1 through Dm), (Fig. 4) and

a scan pulse (SP) and a reset pulse (RP) are alternately applied to a scan electrode (e.g. S2), (SP and RP are in an alternative position), comprising: supplying a data pulse to a plurality of data electrode (Data pulse DP is supplied to data electrodes D1 through Dm);

sequentially supplying a scan pulse (scan pulse SP is applied sequentially) in synchronization with the data pulse (DP) to a plurality of scan electrodes (Scan pulse SP is applied sequentially to scan electrodes S1 through Sm in synchronization with Data pulse, DP, applied to Data line, D), (Fig. 4); and

supplying a plurality of positive reset pulses (RP) to the plurality of scan electrodes (S1 through Sm) or supplying a plurality of negative sawtooth waveform reset pulses to the plurality of data electrodes, in order to get rid of the electric charge charged in a cell to which the scan pulse and data pulse have been supplied ([0067], lines 1-5).

Moon does not teach a sawtooth waveform. Kawasumi teaches a sawtooth waveform are applied to the scan electrode (col. 3, lines 49-54). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the saw-tooth waveforms of Kawasumi to the scan pulse of Moon ('6210) because to affect the dimensions of the image displayed on the screen (col. 3, lines 54-55).

As to claim 9, Moon ('6210) teaches wherein before the scan pulse (SP) is applied to the scan electrode (e.g. S3), (Fig. 4), a plurality of positive reset pulses

(There are two positive reset pulses applied to scan electrode before the scan pulse SP). Moon ('6210) does not teach a sawtooth waveform. Kawasumi teaches a sawtooth waveform are applied to the scan electrode (col. 3, lines 49-54).

As to claim 10, Moon ('6210) teaches wherein after the scan pulse (SP) is applied to one scan electrode (e.g. S1), (Fig. 4), the positive reset pulse (RP) with is applied to each of a plurality of scan electrodes (after the scan pulse SP is applied to scan electrode S1, scan pulse SP is applied to all the other scan electrodes e.g. S2, S3, ..., and Sm).

As to claim 11, Moon ('6210) teaches wherein reset pulse (RP) is applied between scan pulses applied to the ith (Scan pulse of the scan electrode S1) "i is integer which is equal to or greater than `0`" scan electrode and (i+1)th scan electrode (There is a reset scan pulse RP between the scan pulse SP of scan electrode S1 and the scan pulse SP of scan electrode S2), (see Fig. 4 of Moon ('6210)).

As to claim 20, Moon ('6210) teaches after the scan pulse (SP) is supplied to one scan electrode (e.g. S1), the positive reset pulse (RP) is supplied to each of a plurality of scan electrodes (after the signal SP is applied to scan electrode S1, the reset pulse RP is supplied to scan electrodes S2 through Sm), (Fig. 4).

8. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Shimada (U.S. Patent No. 5,400,048), and further in view of Kawasumi (U.S. Patent No. 6,087,788).

As to claim 13, Moon ('6210) does not teach negative sawtooth waveform reset pulses are applied to data electrodes. Shimada teaches before the data pulse (Data pulse = D), (Fig. 8) is applied to the data electrode (X electrode), a plurality of negative reset pulses (R) are applied to the data electrode (there are at least three negative reset pulse applied before data pulse D in the X electrode). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the negative reset pulses of Shimada to the scan pulses of Moon ('6210) because to enable all pixels to display data in a uniform period (col. 3, line 45).

Moon ('6210) and Shimada do not teach a sawtooth waveform. Kawasumi teaches a sawtooth waveforms are applied to the scan electrode (col. 3, lines 49-54). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the saw-tooth waveforms of Kawasumi to the scan pulse of Moon ('6210) as modified by Shimada because to affect the dimensions of the image displayed on the screen (col. 3, lines 54-55).

As to claim 14, note the discussion of Moon ('6210), Shimada, and Kawasumi above. Shimada teaches after the data pulse (D) is supplied to the data electrode (X electrode), the negative reset pulse (negative reset pulse of R) is applied to each data electrode (X electrode represents all data signal lines, col. 8, lines 14-15).

9. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Kawasumi (U.S. Patent No. 6,087,788), and further in view of Shimada (U.S. Patent No. 5,400,048).

As to claim 21, Moon ('6210) does not teach saw-tooth waveforms. Kawasumi teaches a saw-tooth waveforms are applied to the scan electrode (col. 3, lines 49-54). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the saw-tooth waveforms of Kawasumi to the scan pulse of Moon ('6210) because to affect the dimensions of the image displayed on the screen (col. 3, lines 54-55).

Moon ('6210) and Kawasumi do not teach a negative reset pulse supplied to data lines. Shimada teaches after the data pulse (D) is supplied to one data electrode (X electrode), the negative reset pulse (R) is supplied to each of the plurality of data electrodes (X electrode represents all data signal lines, col. 8, lines 14-15), (Fig. 8). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the negative reset pulses of Shimada to the scan pulses of Moon ('6210) as modified by Kawasumi because to enable all pixels to display data in a uniform period (col. 3, line 45).

10. Claims 22-24, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Lin (U.S. Patent No. 6943781).

As to claim 22. Moon ('6210) teaches in a field emission display device (FED, Fig. 15) having:

a data pulse (DP) to a data electrode (D1, D2, ..., Dm) and a scan driving apparatus (Fig. 6) for alternately applying a scan pulse and a reset pulse to a scan electrode ([0099], [0100], and [0104]), (see Fig. 4 scan electrode S2),

the scan driving apparatus comprising: a pulse generator (510) for outputting a prescribed level of voltage through ON/OFF operation of a plurality of switching units ([0101], [0102], [0103], [0106]); and

a scan driving IC (525) for receiving the prescribed level of voltage (Vcc or GND) from the pulse generator ([0094], lines 1-4) and selectively outputting it to an external display panel (paragraphs [0098] through [0107]). Moon ('6210) does not mention a data driving unit connected to data electrodes. Lin teaches a data driving unit (110) connected to data electrodes (112). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the data driving unit of Lin to the field emission display of Moon ('6210) because the data driving unit sends the image data to the data lines to the correspondent pixel electrodes for displaying.

As to claim 23, Moon ('6210) teaches the pulse generator (510) includes two switching units (513 and 514), which respectively output two certain level of voltages (Vcc and GND voltages) by being turned on/off according to an external switching control signal (511, 512), ([0102], [0103], [0105], and [0106]).

As to claim 24, Moon ('6210) teaches the scan driving IC (525) receives two or more prescribed level of voltages (Vcc and GND voltages) from the pulse generator (510) by different input terminals (there are two different input terminals 511 and 512, [0084]).

As to claim 27, Moon ('6210) teaches a timing controller (521) for outputting a timing control signal ([0074], lines 1-3) according to an external control signal (supply timing of the scan pulse);

a buffer (522) for receiving the timing control signal from the timing controller ([0077], lines 1-2), temporarily storing it, and amplifying and outputting the stored signal ([0078], lines 1-2);

a photocoupler (523) electrically divided into a primary side (side that is connected to the first buffer) and a secondary side (side that is connected to the second buffer), receiving the timing control signal from the buffer, and transferring the timing control signal to the secondary side ([0078], lines 3-4); and

a buffer (524) for receiving the timing control signal from the photocoupler, temporarily storing it, and amplifying and outputting the timing control signal ([0079], lines 1-3).

As to claim 28, Moon ('6210) teaches the scan driving IC (525) receives the two prescribed level of voltages (Vcc and GND voltages) from the pulse generator (510) and selectively outputs one of them to the external display panel ([0102], [0103], and [0104])

on the basis of the timing control signal (Scanning data) received from the timing controller (521), ([0097], lines 1-5).

11. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Lin (U.S. Patent No. 6943781) and further in view of Moon (2003/0034939).

As to claim 25, Moon ('6210) does not mention scan driving IC includes a plurality of driving ICs. Lin teaches the scan driving IC (171) includes a plurality of driving ICs (140a-140e). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the scan driving ICs of Lin to the scan driving IC of Moon ('6210) because to scan the scanning lines sequentially (col. 3, line 20). Moon ('6210) and Lin do not teach each of the ICs has two switching units. Moon ('4939) teaches each IC (42) has two switching units (Fig. 7, IC, 42, has two switches) so that when one switching unit is turned on, the other switching unit is turned off ([0118], lines 1-6). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the two switches of Moon ('4939) to the scan driving IC of Moon ('6210) as modified by Lin because to supply positive or negative pulses to scan lines ([0118], lines 4-5).

As to claim 26, Moon ('6210) teaches the driving IC (525) receives two voltages (Vcc and GND voltage) with prescribed levels (GND causes a voltage of zero and Vcc causes a prescribed voltage for RP, [0104], [0106], and [0107]) from the pulse

generator (510) and selectively outputs one of them to an external display panel ([0099]-[0106]).

12. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Lin (U.S. Patent No. 6943781) and further in view of Hofmann (U.S. Patent No. 6,823,693)

As to claim 29, Note the discussion of Moon ('6210) and Lin in claim 22 above. Moon ('6210) teaches wherein the pulse generator (510) comprises:

a plurality of switch driving units (511 and 512) for controlling the plurality of switching units (513 and 514) according to the outputted pulse (SP) at a point when the scan pulse rises (RP is applied to SP at the rising edge of SP), ([0087] and [0089]); and

a resister (R, Fig. 11) for controlling a tilt of a positive voltage (Slope of RP) outputted by the switching unit (552), ([0149], lines 1-2; [0151], lines 1-7).

Moon ('6210) does not teach a monostable multivibrator. Hofmann teaches a monostable multivibrator (69) for outputting a certain frequency of pulse (low pulse) according to an external switching control signal (52), (col. 9, lines 9-15). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the monostable multivibrator of Hofmann to the switch driving units of Moon ('6210) as modified by Lin because to monitor a rate of the flow of charge through the charge flow path (col. 2, lines 33-34).

13. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Lin (U.S. Patent No. 6943781) and further in view of Kawasumi (U.S. Patent No. 6,087,788).

As to claim 30, Note the discussion of Moon ('6210) and Lin in claim 22 above. Moon ('6210) teaches before the scan pulse (SP), (Fig. 4) is applied to the scan electrode (e.g. S3), a plurality of positive reset pulses to the scan electrode (there are two reset scan pulses, RP, applied before the scan pulse, SP, in scan electrode S3). Moon ('6210) and Lin do not teach a sawtooth waveform. Kawasumi teaches a saw-tooth wave generation circuit (102) including capacitors and resistors to vary the pulse width of the horizontal scanning pulse. (col. 3, lines 49-54). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the sawtooth signals of Kawasumi to the scan pulse of Moon ('6210) as modified by Lin because the dimensions of the image displayed on the screen are affected (col. 3, lines 54-55).

14. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Lin (U.S. Patent No. 6943781) and further in view of Kawasumi (U.S. Patent No. 6,087,788) and Shimada (U.S. Patent No. 5,400,048).

As to claim 31, Moon ('6210) and Lin do not teach a sawtooth waveform. Kawasumi teaches a saw-tooth wave generation circuit (102) including capacitors and

resistors to vary the pulse width of the horizontal scanning pulse. (col. 3, lines 49-54). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the sawtooth signals of Kawasumi to the scan pulse of Moon ('6210) as modified by Lin because the dimensions of the image displayed on the screen are affected (col. 3, lines 54-55).

Moon ('6210), Lin, and Kawasumi do not teach a negative reset pulse. Shimada (Fig. 9) teaches wherein before the data pulse (waveform D) is applied to the data electrode (X electrode), a plurality of negative waveform reset pulses (R) are applied to the data electrode (X electrode), (Fig. 9). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the negative waveform reset pulse of Shimada to the scan pulse of Moon ('6210) as modified by Lin and Kawasumi because of enabling all pixels to display data in a uniform period irrespective of which order the pixels are scanned (col. 3, lines 45-46).

15. Claims 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Lin (U.S. Patent No. 6943781).

As to claim 32, Moon ('6210) teaches a field emission display device having a data pulse (DP) to a data electrode (electrode D) and a scan driving apparatus (Fig. 6) for alternately applying a scan pulse (SP) and a reset pulse (RP) to a scan electrode (SP and RP are applied alternatively to scan electrode e.g. S3), (see Fig. 4),

the scan driving apparatus comprising:

a timing controller (521) for receiving an external control signal (supply timing of the scan pulse) and outputting a timing control signal ([0194], lines 2-3) and

a plurality of switching control signals (signals from 511 and 512);

a pulse generator (510) having a plurality of switching units (513 and 514) and outputting two or more prescribed levels of voltages (Vcc and GND voltages) as the plurality of switching units are turned on/off by a plurality of switching control signals (513 is controlled by signals from 511 and 514 is controlled by signals from 512) outputted from the timing controller (511 and 512); and

a scan driving IC (525), receiving by different input terminals (terminals of 530-1 and 530-m) two or more prescribed level of voltages (VCC and GND voltages) outputted from the pulse generator (510 supplies Vcc and GND voltages), and selectively outputting one of the two or more prescribed level of voltages to a panel according to the timing control signal (signals from 511 and 512) outputted from the timing controller (511 and 512), ([0101] through [0106]). Moon ('6210) does not mention a scan driving IC having a plurality of driving ICs. Lin teaches a scan driving IC (171) having a plurality of driving ICs (140a-140e).

Moon ('6210) does not mention a data driving unit connected to data electrodes. Lin teaches a data driving unit (110) connected to data electrodes (112). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the data driving unit of Lin to the field emission display of

Moon ('6210) because the data driving unit sends the image data to the data lines to the correspondent pixel electrodes for displaying.

As to claim 33, Moon ('6210) teaches wherein each driving IC (e.g. 525) constituting the scan driving IC includes a plurality of switching units (530-1 through 530-m) turned on/off by a timing control signal ([0080], lines 1-5) outputted from the timing controller (the signal supplied to the second buffer is from timing controller 521), ([0074], lines 1-11).

As to claim 34, this claim differs from claim 32 only in that the limitation "a switching unit upon receiving the switching control signal and outputting a prescribed level of voltage is recited". Moon ('6210) teaches a pulse generator (510) for turning on/off a switching unit (513) upon receiving the switching control signal (signal from reset drive IC 511) and outputting a prescribed level of voltage (switch 513 causes the circuit 510 to supply the voltage of Vcc to circuit of 520).

16. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Lin (U.S. Patent No. 6943781) and further in view of Hofmann.

As to claim 35, Moon ('6210) teaches wherein the pulse generator (510) comprises:

a plurality of switch driving units (511 and 512) for controlling the plurality of switching units (513 and 514), ([0087] and [0089]); and

a resister (R, Fig. 11) for controlling a tilt of a positive voltage (Slope of RP) outputted by the switching unit (552), ([0149], lines 1-2; [0151], lines 1-7). Moon ('6210) does not teach a monostable multivibrator. Hofmann teaches a monostable multivibrator (69) for outputting a certain frequency of pulse (low pulse) according to the switching control signal (52), col. 9, lines 9-15). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the monostable multivibrator of Hofmann to the switch driving units of Moon ('6210) as modified by Lin because to monitor a rate of the flow of charge through the charge flow path (col. 2, lines 33-34).

17. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moon ('6210) in view of Lin (U.S. Patent No. 6943781) and further in view of Shimada (U.S. Patent No. 5,400,048) and Yano (U.S. Patent No. 5,896,115).

As to claim 36, Moon ('6210) teaches a field emission display device comprising:

a scan driving apparatus (Fig. 4, scan line S3) for previously supplying a reset pulse (RP) to a scan electrode (e.g. S3) before supplying a scan pulse thereto (SP), (reset pulse RP is applied to scan electrode S3 before the scan pulse is applied).

Moon ('6210) does not mention a data driving unit connected to data electrodes. Lin teaches a data driving unit (110) connected to data electrodes (112). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention

was made to have added the data driving unit of Lin to the field emission display of Moon ('6210) because the data driving unit sends the image data to the data lines to the correspondent pixel electrodes for displaying.

Moon ('6210) and Lin do not teach a negative reset pulse to a data electrode. Shimada teaches a negative reset pulse (R), (Fig. 7) applied to the data electrode (X electrode) before supplying a data pulse thereto (Fig. 7 clearly shows a negative reset signal R is applied before the signal D in electrode X). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the negative waveform reset pulse of Shimada to the scan pulse of Moon ('6210) as modified by Lin because of enabling all pixels to display data in a uniform period irrespective of which order the pixels are scanned (col. 3, lines 45-46).

Moon ('6210), Lin, and Shimada do not teach preventing a leakage current from flowing to a data electrode. Yano teaches preventing a leakage current from flowing to an electrode (abstract, lines 5-9). Therefore it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have added the current leakage preventing current of Yano to the data electrodes of Moon ('6210) as modified by Lin and Shimada because to effectively prevent leakage luminescence due to a leakage voltage (col. 5, 17-18).

Allowable Subject Matter

18. Claims 12, 15, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hansen (U.S. Patent No. 6,166,490) teaches a field emission display of uniform brightness across the entire display screen.

Koyama (U.S. Patent No. 6,815,901) teaches a display device using electron surface elements.

Inquiry

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pegeman Karimi whose telephone number is (571) 270-1712. The examiner can normally be reached on Monday-Thursday 8:00am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on (571) 272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Pegeman Karimi
12/09/2007

CHANH D. NGUYEN
SUPERVISORY PATENT EXAMINER